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Terms: **patno=5462120** ([Edit Search](#))

814585 (08) 5462120 October 31, 1995

UNITED STATES PATENT AND TRADEMARK OFFICE GRANTED PATENT  
**5462120**

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[Link to Claims Section](#)

October 31, 1995

Downhole equipment, tools and assembly procedures for the drilling, tie- in and completion  
of vertical cased oil wells connected to liner-equipped multiple drainholes

**REISSUE:** Reissue Application filed Sep. 21, 2001 (O.G. Mar. 12, 2002) Ex. Gp.: 3506; Re.  
S.N. 09/956,806 Reissue Application filed Apr. 4, 2001 (O.G. Dec. 25, 2001) Ex. Gp.: 3673;  
Re. S.N. 09/824, 738 Reissue Application filed Sep. 4, 2001 (O.G. Dec. 18, 2001) Ex. Gp.:  
3672; Re. S.N. 09/944,115 Reissue Application filed May 22, 1997 (O.G. Oct. 28, 1997) Ex.  
Gp.: 3506; Re. S.N. 08/861,457, (O.G. March 12, 2002)  
October 8, 2002 - This Patent was reissued as Reissue Patent RE 37,867 (O.G. October 8,  
2002)

**INVENTOR:** Gondouin, Michel, San Rafael, CA

**APPL-NO:** 814585 (08)

**FILED-DATE:** January 4, 1993

**GRANTED-DATE:** October 31, 1995

**ASSIGNEE-AT-ISSUE:** S-Cal Research Corp., San Rafael, CA

**ASSIGNEE-AFTER-ISSUE:** April 20, 1992 - ASSIGNMENT OF ASSIGNORS INTEREST., S-CAL  
RESEARCH CORPORATION 32, SAN MARINO DR SAN RAFAEL CALIFORNIA 94901, Reel and  
Frame Number: 006081/0249

December 2, 1996 - ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR  
DETAILS)., HALLIBURTON COMPANY P.O. BOX 819052 LEGAL, INTELLECTUAL PROPERTY  
DEPARTMENT D ALLAS TEXAS 75381, Reel and Frame Number: 008251/0146

May 22, 1997 - CHANGE OF NAME (SEE DOCUMENT FOR DETAILS)., HALLIBURTON ENERGY  
SERVICES, INC. LEGAL, INTELLECTUAL PROPERTY DEPARTMENT P.O. BOX 819052 DALLAS  
TEXAS 75381, Reel and Frame Number: 008535/0562

**IPC-MAIN-CL:** E 21B007#4

**IPC ADDL CL:** E 21B043#0

**PRIM-EXMR:** Dang, Hoang C.

**CORE TERMS:** drainhole, tubing, casing, liner, pump, string, packer, whipstock, completion,  
window ...

**ENGLISH-ABST:**

Single horizontal wells drilled through heterogeneous reservoirs are capable of greater oil productivity than vertical wells, often with lower produced GOR and WOR. Multiple drainholes tied-in to a vertical cased well are even more beneficial. Completion of such drainholes in many sandy reservoirs must use cemented liners. Well configurations comprising multiple drainholes liners, each of them tied- in to a vertical casing by pressure-tight connections require novel technologies making use of some novel downhole equipment, tools and procedures for drilling, tie-in and completion of such wells. These may be for newly-drilled wells or may be obtained by re-entry into an existing vertical cased well. Specific equipment, including novel casing joints, whipstocks, intermediate liners and tubing completion assembly components applicable to new wells are described herein. Equipment comprising novel casing inserts and patches applicable to re-entry wells, and the corresponding tubing completion assembly components for a variety of well exploitation modes are also described, together with the required tools and procedures. The liners of the drainholes are such that known well logging and cleaning tools may be used throughout the well's life. The various tubing completion assemblies can all be run-in and installed in a single trip. They allow either commingled flow from all drainholes or selective injection into some drainholes while others are under production. They are adapted to a variety of reservoir pressure conditions and of oil types, including heavy oil produced by sequential "huff and puff" steam injection.

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(i)

Terms: **patno=5462120** ([Edit Search](#))

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Segments: [Appl-no](#), [Assignee](#), [Asst-exmr](#), [Date](#), [Exmr](#), [Int-cl](#), [Inventor](#), [Legal-rep](#), [Patno](#), [Pct-pub-date](#), [Prim-exmr](#), [Reissue](#), [Title](#)

Date/Time: Wednesday, March 19, 2003 - 4:22 PM EST

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Courts and Administrative*

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Search statement 2

Query/Command : PRT SS 1 MAX 1 LEGALALL

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**Patent Number :**

US5462120 A 19951031 [US5462120]

**Title :**

(A) Downhole equipment, tools and assembly procedures for the drilling, tie-in and completion of vertical wells connected to liner-equipped multiple drainholes

**Patent Assignee :**

(A) S CAL RESEARCH CORP (US)

**Patent Assignee :**

S-Cal Research Corporation, San Rafael CA [US]

**Inventor(s) :**

(A) GONDOUIN MICHEL (US)

**Application Nbr :**

US81458593 19930104 [1993US-0814585]

**Priority Details :**

US81458593 19930104 [1993US-0814585]

**Intl Patent Class :**

(A) E21B-007/04 E21B-043/00

**EPO ECLA Class :**

E21B-007/06B

E21B-041/00L2

E21B-043/10

E21B-043/24

**US Patent Class :**

ORIGINAL (O) : 166380000; CROSS-REFERENCE (X) : 166050000 166117600 166242100 175061

**Document Type :**

Basic

**Citations :**

US1816260; US2397070; US2492079; US3330349; US4396075; US4396230; US4415205; US448978

US4742871; US5052482; US5085275; US5115872; US5127457

**Publication Stage :**

(A) United States patent

**Abstract :**

Single horizontal wells drilled through heterogeneous reservoirs are capable of greater oil productivity wells, often with lower produced GOR and WOR. Multiple drainholes tied-in to a vertical cased well a beneficial. Completion of such drainholes in many sandy reservoirs must use cemented liners. Well con comprising multiple drainholes liners, each of them tied-in to a vertical casing by pressure-tight connec novel technologies making use of some novel downhole equipment, tools and procedures for drilling, ti completion of such wells. These may be for newly-drilled wells or may be obtained by re-entry into an cased well. Specific equipment, including novel casing joints, whipstocks, intermediate liners and tubin assembly components applicable to new wells are described herein. Equipment comprising novel casi! patches applicable to re-entry wells, and the corresponding tubing completion assembly components fo well exploitation modes are also described, together with the required tools and procedures. The liners are such that known well logging and cleaning tools may be used throughout the well's life. The variou completion assemblies can all be run-in and installed in a single trip. They allow either commingled flo drainholes or selective injection into some drainholes while others are under production. They are adap of reservoir pressure conditions and of oil types, including heavy oil produced by sequential "huff and p injection.

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1 / 1 LGST - ©LEGSTAT

**Patent Number :**

US 5462120 [US5462120]

**Application Details :**

US 814585/93 19930104 [1993US-0814585]

**Document Type :**

US-P

**Action Taken :**

19920420 US/AS02

ASSIGNMENT OF ASSIGNOR'S INTEREST

S-CAL RESEARCH CORPORATION 32, SAN MARINO DR SAN RAFAEL, CALIFORNIA 94901

MICHEL : 19911221

19930104 US/AE-A

APPLICATION DATA (PATENT)

US 814585/93 19930104 [1993US-0814585]

19951031 US/A

PATENT

19961202 US/AS02

ASSIGNMENT OF ASSIGNOR'S INTEREST  
HALLIBURTON COMPANY P.O. BOX 819052 LEGAL, INTELLECTUAL PROPERTY DEPARTM  
S-CAL RESEARCH CORPORATION : 19961121

19970522 US/AS01  
CHANGE OF NAME  
HALLIBURTON ENERGY SERVICES, INC. LEGAL, INTELLECTUAL PROPERTY DEPARTME  
HALLIBURTON COMPANY : 19961212

19971028 US/RF  
REISSUE APPLICATION FILED  
970522

20011218 US/RF  
REISSUE APPLICATION FILED  
20010904

20011225 US/RF  
REISSUE APPLICATION FILED  
20010404

20020312 US/RF  
REISSUE APPLICATION FILED  
20010921

**Update Code :**

2002-12

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1 / 1 CRXX - ©CLAIMS/RRX

**Patent Number :**

5,462,120 A 19951031 [US5462120]

**Patent Assignee :**

S-Cal Research Corp

**Actions :**

19961202 REASSIGNED  
ASSIGNMENT OF ASSIGNORS INTEREST

Assignor: S-CAL RESEARCH CORPORATION DATE SIGNED: 11/21/1996

Assignee: HALLIBURTON COMPANY P.O. BOX 819052 LEGAL, INTELLECTUAL PROPERTY  
DALLAS TEXAS 75381

Reel 008251/Frame 0146

Contact: HALLIBURTON ENERGY SERVICES WILLIAM M. IMWALLE LEGAL, INTELLECTU  
DEPARTMENT MAIL CODE 1-B-121, P.O. BOX 819052 DALLAS, TX 75381

19970522 REASSIGNED  
CHANGE OF NAME

Assignor: HALLIBURTON COMPANY DATE SIGNED: 12/12/1996

Assignee: HALLIBURTON ENERGY SERVICES, INC. LEGAL, INTELLECTUAL PROPERTY DE  
P.O. BOX 819052 DALLAS TEXAS 75381

Reel 008535/Frame 0562

Contact: HALLIBURTON ENERGY SERVICES, INC. PAUL I. HERMAN LEGAL, INTELLECTUA  
DEPT. MAIL CODE 1-B-121, P.O. BOX 819052 DALLAS, TX 75381

19970522 REISSUE REQUESTED  
ISSUE DATE OF O.G.: 19971028  
REISSUE REQUEST NUMBER: 08/861457  
EXAMINATION GROUP RESPONSIBLE FOR REISSUEPROCESS: 3506  
Reissue Patent Number: USRE37867

20010404 REISSUE REQUESTED  
ISSUE DATE OF O.G.: 20011225  
REISSUE REQUEST NUMBER: 09/824738  
EXAMINATION GROUP RESPONSIBLE FOR REISSUEPROCESS: 3673

Reissue Patent Number:

20010904 REISSUE REQUESTED  
ISSUE DATE OF O.G.: 20011218  
REISSUE REQUEST NUMBER: 09/944115  
EXAMINATION GROUP RESPONSIBLE FOR REISSUEPROCESS: 3672

Reissue Patent Number:



20010921 REISSUE REQUESTED  
ISSUE DATE OF O.G.: 20020312  
REISSUE REQUEST NUMBER: 09/956806  
EXAMINATION GROUP RESPONSIBLE FOR REISSUEPROCESS: 3506

Reissue Patent Number:

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Search statement 1

Query/Command : US5462120/PN

**\*\* SS 1: Results 1**

Search statement 2

Query/Command : PRT SS 1 MAX 1 LEGAL

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/// INPADOC - ©INPADOC

**Patent Number :**

US 5462120 A 19951031 [US5462120]

**Title :**

DOWNHOLE EQUIPMENT, TOOLS AND ASSEMBLY PROCEDURES FOR THE DRILLING, TIE  
COMPLETION OF VERTICAL CASED OIL WELLS CONNECTED TO LINER-EQUIPPED MULT  
DRAINHOLES

**Inventor(s) :**

GONDOUIN MICHEL [US]

**Patent Assignee (Words) :**

S CAL RESEARCH CORP [US]

**Application Details :**

US 814585/93-A 19930104 [1993US-0814585]

**Priority Details :**

US 814585/93-A 19930104 [1993US-0814585]

**Intl. Patent Class. :**

E21B-007/04; E21B-043/00

**WPI Cross Reference :**

1995-382077 (C)

1 / 1 LGST - ©LEGSTAT

**Patent Number :**

US 5462120 [US5462120]

**Application Details :**

US 814585/93 19930104 [1993US-0814585]

**Document Type :**

US-P

**Action Taken :**

19920420 US/AS02

ASSIGNMENT OF ASSIGNOR'S INTEREST

S-CAL RESEARCH CORPORATION 32, SAN MARINO DR SAN RAFAEL, CALIFORNIA 94901  
MICHEL : 19911221

19930104 US/AE-A

APPLICATION DATA (PATENT)

US 814585/93 19930104 [1993US-0814585]

19951031 US/A

PATENT

19961202 US/AS02

ASSIGNMENT OF ASSIGNOR'S INTEREST

HALLIBURTON COMPANY P.O. BOX 819052 LEGAL, INTELLECTUAL PROPERTY DEPARTM  
S-CAL RESEARCH CORPORATION : 19961121

19970522 US/AS01

CHANGE OF NAME

HALLIBURTON ENERGY SERVICES, INC. LEGAL, INTELLECTUAL PROPERTY DEPARTME  
HALLIBURTON COMPANY : 19961212

19971028 US/RF

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970522

20011218 US/RF

REISSUE APPLICATION FILED

20010904

20011225 US/RF

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20010404

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20010921

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**Query/Command : ..ST**